ΚΥΚΛΟΣ ΣΕΜΙΝΑΡΙΩΝ ΣΤΑΤΙΣΤΙΚΗΣ ΙΑΝΟΥΑΡΙΟΣ 2017

Στέφανος Κεχαγιάς
SAS Institute

ΤΡΙΤΗ 10/1/2017
13:00

ΑΙΘΟΥΣΑ 607, 6^{ος} ΟΡΟΦΟΣ,
ΚΤΙΡΙΟ ΜΕΤΑΠΤΥΧΙΑΚΩΝ ΣΠΟΥΔΩΝ
(ΕΥΕΛΠΙΔΩΝ & ΛΕΥΚΑΔΟΣ)

ΠΕΡΙΛΗΨΗ

In this talk we examine a bivariate count time series of Saffir-Simpson Category 3 and stronger annual hurricane counts in the North Atlantic and Pacific Ocean Basins. As land and ocean temperatures on our planet warm, an intense climatological debate has arisen over whether hurricanes are becoming more numerous, or whether the strengths of the individual storms are increasing. Recent literature concludes that an increase in hurricane counts occurred in the Atlantic Basin circa 1994. This increase persisted through 2012; moreover, the 1994-2012 period was one of relative inactivity in the Pacific Basin. When Atlantic activity eased in 2013, heavy activity in the Pacific Basin commenced. When examined statistically, a Poisson white noise model for the annual severe hurricane counts is difficult to resoundingly reject. Yet, decadal cycles (longer term dependence) in the hurricane counts is plausible.

To take a statistical look at the issue, we introduce a stationary multivariate count time series model that is able to produce arbitrary marginal distributions, allows for negative auto- and cross-correlations, and can capture long-range dependence, features that most previous count models cannot achieve. We derive the autocovariance function of the model for Poisson marginal distributions, and propose a quasi-maximum likelihood estimation method to estimate its parameters. The satisfactory performance of the method is verified in a Monte Carlo study. Finally, we fit the model to the data to conclude that severe hurricane counts are indeed negatively correlated across the two ocean basins and present some evidence of long-range dependence.

Stefanos Kechagias
SAS Institute

TUESDAY 10/1/2017
13:00

**ROOM 607, 6th FLOOR,
POSTGRADUATE STUDIES BUILDING
(EVELPIDON & LEFKADOS)**

ABSTRACT

In this talk we examine a bivariate count time series of Saffir-Simpson Category 3 and stronger annual hurricane counts in the North Atlantic and Pacific Ocean Basins. As land and ocean temperatures on our planet warm, an intense climatological debate has arisen over whether hurricanes are becoming more numerous, or whether the strengths of the individual storms are increasing. Recent literature concludes that an increase in hurricane counts occurred in the Atlantic Basin circa 1994. This increase persisted through 2012; moreover, the 1994-2012 period was one of relative inactivity in the Pacific Basin. When Atlantic activity eased in 2013, heavy activity in the Pacific Basin commenced. When examined statistically, a Poisson white noise model for the annual severe hurricane counts is difficult to resoundingly reject. Yet, decadal cycles (longer term dependence) in the hurricane counts is plausible.

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